

Sidebands

The Newsletter of the EAST GREENBUSH AMATEUR RADIO ASSOCIATION



www.egara.club

May 2018

President - Tom Scorsone, KC2FCP
Secretary - Steve VanSickle, WB2HPR

Vice-President - Nick Field, KD2JCR
Treasurer, Webmaster & Newsletter Editor - Bryan Jackson, W2RBJ

EGARA Elections Bring Some New Faces

EGARA's April membership meeting brought the election of two new officers who had not previously held office. Nick Field, KD2JCR, was unanimously elected Vice President, replacing Ridge Macdonald, KB2HWL. Macdonald chose to run for President but was narrowly defeated by long-time incumbent President Tom Scorsone, KC2FCP. Also elected for the first time to a club office was David Jaeger, Jr., K2DEJ who secured a position on the Board of Directors.

"I am honored to have the privilege to serve EGARA and its members for another term," said President Scorsone. "I am also happy that we have some new additions to the club's leadership. I look forward to their input and suggestions for making our club better."

In addition to Scorsone, three other incumbents were returned to their offices. They included Secretary Steve VanSickle, WB2HPR, Treasurer Bryan Jackson, W2RBJ, and Dave Gillette, KC2RPU. Russ Greeman, WB2LXC, who previously served as club Secretary, also won a seat on the Board.

Club officers serve for a term of one year, while Board members serve for a three year term.



Nick Field, KD2JCR, was elected to serve as EGARA's Vice President

Trojan Electronics to Close in May After 82 Years

Amateur radio is losing another long-time source for electronic parts and equipment with the closing of Trojan electronics after some eight decades of service to the Capital Region. Owner Steve Page expects to close the business permanently some time during May citing declining sales of electronic parts and components.

"The business has changed dramatically over the years," said Page. "Electronics today are now thrown away when they break and most electronic enthusiasts have turned to the Internet for their parts and supplies. For local retailers it has unfortunately become unprofitable."



Third generation Trojan Electronics owner Steve Page behind the counter

Trojan opened in 1936 when Steve's grandfather, Albert Page, began selling "Radio Parts" in downtown Troy. Over the years the business thrived as it provided electronic parts to radio and television servicemen, local students, engineers, technicians, radio amateurs and electronic "tinkerers". Customers also included area colleges (especially RPI), businesses, industries, and municipalities.

In This Issue

Page 1 - EGARA Elections / Trojan Closing
Page 3 - Check Your Closet for Antennas!
Page 4 - Hamfest Preview / CQ for Volunteers
Page 5 - How Well is Your HT Working?
Page 6 - March Meeting Minutes
Page 7 - On the Beam - News & Notes
Page 8 - History of Ham Radio - QST
Page 9 - Column: ARRL - How Can We Help?
Page 10 - This Month in Radio History
Page 11 - Calendar / Buy, Swap, Sell / Pro Tip

(continued on page two)

Save the Date! Next Membership Meeting - May 9, 2018 at 7 pm

Trojan Closing After 82 Years...



Herb Page

"Hundreds of RPI Graduates will, I'm sure, recall their visits to our store to get stuff for their personal or class projects," said Steve's father, Herb Page, prior to his death last September at the age of 88. "Many a design has taken final shape in our store as the builder fondled the prospective parts and made sure of their suitability,"

Trojan eventually moved in the 1950s from its downtown Troy location to 15 Middleburgh Street, where it has operated for over a half century. Just as Herb joined his father in the business, Steve chose to do the same when he turned 22.

One of the company's many employees over the years was EGARA club member Steve VanSickle, WB2HPR.

"I began doing business with Trojan in the 1960's – when selling and servicing color televisions was an exploding business, and TV's were sold wherever they could be put on display," Steve recalled. "Naturally, these sets utilized vacuum tube technology, and were prone to frequent breakdowns, necessitating a cadre of experienced repairmen -- and TV repair shops sprang up everywhere. Replacement parts and tubes were most often obtained from local sources such as Trojan Electronics. Business was good back then – VERY good, in fact."

In the early 1970's, Trojan decided that it would be wise to provide its own bench service for institutional and industrial electronics.

"I was hired to fill this position," Steve said. "Typically, my work was limited to public address systems, industrial controls, and some consumer goods so as not to be in direct competition with Trojan's service shop clientele. Also, since I held an FCC First Class Radiotelephone license, I became involved in servicing business and marine radios.

"It was an exciting time, with each day going to work in a beehive of electronic activity - repairing and building electronic equipment, interacting with customers and vendors – always at a double-time pace. The shelves were crammed full of the latest parts, tools, and equipment available – and what was not there was ordered right away from a variety of suppliers. The lights were bright, and the store was humming with activity six days a week," Steve remembered fondly.

But soon solid-state technology gained a strong foothold and became a major game changer in the electronics industry. Seemingly overnight, the tube business started to fall-off as demand for transistors and integrated circuits grew. Also, transistor technology made a huge difference in reliability, and modular construction lessened the demand for skilled point-to-point troubleshooting at the component level. With less demand for service, the parts business, a mainstay of Trojan's business, also began to falter.

"With the advent of the Internet, Ebay, and big box sellers, we have become users of 'disposable' electronic devices," VanSickle observed. Usually the cost of repairs far outweighs the cost of replacement – so there is very limited demand for repair and replacement parts, such as those obtained from dealers like Trojan."

The loss of Trojan follows the closing of several area Radio Shack stores, as well as E.E. Taylor, another local electronics store that went out of business after operating for decades at its location on Central Avenue in Albany. Currently, only Grimmer's Electronic Supply remains, with its store on Brandywine Avenue in Schenectady.

"It's a sad day knowing that Trojan must turn off the lights and lock the door," VanSickle reflected. "I have fond memories of the hustle and bustle, the excitement of 'what's new in electronics', and the anticipation of working with my fellow employees. I can truly say – I never had a bad day while working at Trojan.

"Now, even as a customer, I'll miss the place. My thanks go to third generation owner, Steve Page, for all his many years of professionalism, kindness, and great service."



Quick! Check Your Closet...

You Might Just Have a Dual Band Antenna Hanging in There

You probably wouldn't think to check your closet to see if you might have a dual band VHF/UHF antenna mixed in with your shirts and pants. But a cheap solution to getting on 2 meters and 70 cm is likely hanging there too.

Originally published in the April 2018 issue of QST magazine, the "coat hanger" antenna got the attention of EGARA member Steve VanSickle, WB2HPR, and he decided to build one for himself to try out. And then he proceeded to design and build an "improved" version. Here's what Steve had to say about the project:

"In QST, John Portune, W6NBC, described a method of constructing a basic 2-meter base station antenna. In his article, "An Ultra Simple 2-Meter Antenna", the design utilizes two wire coat hangers for the radiating elements of this broad banded VHF design which also works on the 70cm band.

Just for fun, I decided to construct one for my own use and evaluation. This minimalist approach to construction works quite well – I was very impressed with its simplicity, and of course, its low cost.

After performing some of my own tests, I began to consider the possibility of altering the design with the goal of increasing the antennas mechanical integrity. (Think of resistance to ice, snow, and winds here in the Capital Region and elsewhere.) Also, the wire coat hangers are becoming a rare commodity these days, with most common coat hangers constructed of plastic (a non-conductor).

My ruggedized version of the simple 2-meter antenna consists of ½ inch PVC pipe, 2 added pipe fittings (1-el and 1-cross) and radiating elements made from AWG# 12 wire stripped from commonly available Romex (house wiring). Also, instead of using crimp terminals to connect the coax cable to the radiating elements, I soldered the connections directly, eliminating the possibility of a corroded signal path. Otherwise, the build is essentially the same as the original, but with better mechanical support, and improved conductivity. All of the materials, except for the coax cable, are readily available from your local hardware store. (If you would like an assembly drawing, contact me)

I brought these two examples to the most recent EGARA meeting on April 11, 2018 for demonstration and to allow members to see how easy it is to construct them. During testing, I also found that that these antennas also work nicely on the 70 cm band. This is no doubt due to the bow-tie radiator configuration - a style widely used in TV and FM broadcast services. Bonus: You can use this antenna with your dual band radio.

So, the next time you are in need of 2-meter base antenna, consider constructing your own using these ideas. Its fun, educational, and you'll save a bunch of money by doing so."



Top: Steve holds two versions of the "coat hanger" dual band antenna. On the left is the original design which uses two wire coat hangers made of steel. On the right is his improved model which uses regular 12 ga Romex electrical wire made of copper, a better conductor of RF. The Romex version is basically identical in shape as the coat hanger version, but can be tuned easier by bending the copper Romex wire to achieve a better SWR reading depending on the frequency used.

Below: six turns of coax around the PVC support pipe provide an effective RF choke.



A Useful Tip!
Make sure the PVC-type mounting pipe you use is not electrically conductive. Put a piece in a microwave for 30 seconds and see if it's warm to the touch. Don't use it if it is.

Hamfest 2018: Set to be Bigger and Better Than Ever

EGARA's Hamfest 2018 on May 12th is shaping up to be the best ever, with several new offerings and more raffles and giveaways than ever before! We have also picked up another sponsor - BaofengTech!

This year's Grand Prize will offer a brand new dual band Yaesu 7900R mobile radio, with a First Place prize of a UV5X3 Tri-Band HT Radio from Baofeng Tech, the only fully authorized U.S. dealers of Baofeng radios. In addition, the club will be raffling off THREE Tri-band UV5X3 HT radios! Tickets will be just \$2 each or three tickets for \$5. A host of door prizes will also be given away, including items from KJI Electronics, MFJ and Quicksilver radio. Gift certificates and publications provided by the ARRL will also be given away.

**This year the club
will be raffling off
Three Tri-Band
HT radios!**

On the food front, EGARA will once again be serving up a variety of delicious items, including breakfast sandwiches, and premium all-beef hamburgers, cheeseburgers and hot dogs. A new grill purchased by the club ensures that food will be prepared quickly and be served up fresh and hot. New additions to the beverage menu this year include tea and hot chocolate.

Vendor tables in the pavilion are available but are already going fast on a first come, first served basis. Anyone interested in reserving a table should contact EGARA President Tom Scorsone by phone at (518) 272-1494 or by email at KC2FCP@nycap.rr.com as soon as possible. Tailgating will also be available to hams that have items to sell. General admission this year will again be just \$6 and includes a chance to win the Grand Prize. Those attending are reminded that they must be present to win prizes and giveaways. Hours for this year's Hamfest will be from 8 am to 1 pm.

CQ for Hamfest Volunteers

Hamfest 2018 is coming right up on May 12th and the club is looking for volunteers to help make it a great event again this year. While several members have already signed up, a number of jobs remain open. These include staging operations at the Masonic Temple on Friday evening at 6:30 pm, setting up on Saturday morning starting at 6:00 am and cleaning up at 1 pm when the event winds down. Help is also needed in the kitchen serving up the many food items that will be available for sale.

"Hamfest is the lifeblood of our club and provides the majority of the revenue we need to support club events and activities all year," said EGARA President Tom Scorsone. "A successful Hamfest also allows us to keep the club's equipment and repeater systems in good repair and upgraded when needed."

Members who have yet to sign-up for Hamfest are requested to send an email indicating their availability to Bryan Jackson at W2RBJ@Outlook.com.



Dave Williams, N2VLQ, gets an order ready in the kitchen at Hamfest 2017



2018 EGARA Hamfest Sponsors
Please support these companies that support us!





How Well is Your HT Working? Find Out at the May Meeting!

Does your portable hand-held radio work as well as it should? Does it put out its full rated power? Is its signal clean? If you're not sure, there's a very easy way to find out -- bring it to the EGARA meeting on May 9th and have it tested!



Our May program will explain how radios can be checked for proper operation and the equipment used to do it. Steve VanSickle will guide us on the procedures used and give us an overview of how and what to look for when testing radio gear.

In addition to checking power output, we'll learn about the importance of transmitting a "clean" signal and what happens when poorly performing radios send out "splatter" and extraneous frequencies and harmonics.

After his presentation, Steve will check any HT radio that members want to have tested and he'll show exactly how well they are meeting their published ratings. So, if you've ever wondered whether your HT is up to par, bring it to EGARA's May membership meeting and find out!

If It's Monday at 7 pm... It Must Be Ragchew Time!

If you're looking to stay in contact with other club members join the EGARA ragchew on VHF each Monday night at 7 pm. The "chew" will use the club's repeater on 147.270 (+) / PL Tone 94.8.

Members are invited to join in on the conversation and share whatever topic comes up. It not only provides a chance to catch up on club news, but it also provides a chance to ask the club's "Elmers" questions you may have about operating or technical issues. There will be no formal "net" protocol, so members can jump in any time there's a break to make a comment or ask a question.

Holding the weekly ragchew on the 147.270 repeater also makes participation available to all license classes -- from Tech to Extra.

Thanks to These Members for Their Support!

EGARA gratefully acknowledges the following members for payment of their 2018 dues.

- Bob & Claudia Stark, KA2EXK / KC2VWO
- Walt Snyder, N2WJR
- Al Plouff, KB2MVP
- Steve Marsh / Deb Mariani / Judie Marsh
KC2USX / KC2ULU / KC2SQL

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<https://www.egara.club/pay-dues>
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EGARA April Meeting Minutes

- The April meeting of the EGARA was called to order at 7:28 PM by President Tom Scorsone, KC2FCP. The Treasurer's report was presented by Treasurer Bryan Jackson, W2RBJ and approved by the membership. Dues from several members were also accepted and acknowledged.
- The Race for Literacy will be held on May 6th at the Schodack Island State Park and the club has agreed to provide radio communications again this year. A sign-up sheet was circulated. The annual Hamfest planning is well under way. Several key sponsors have agreed to support the club. Volunteers are being sought to staff this annual event and a sign up sheet was circulated. Also, EGARA will provide communications for the Run for Liza again this year.
- Annual election of officers and Board of Directors was conducted. Winners were: President – Tom Scorsone, KC2FCP; Vice president - Nick Field, KD2JCR; Secretary – Steve VanSickle WB2HPR; Treasurer – Bryan Jackson, W2RBJ. Open Board of Director positions will be filled by Dave Gillette, KC2RPU, Dave Jaeger, K2DEJ, and Russ Greenman, WB2LXC (see story on page 1).
- A presentation was given by Steve VanSickle, WB2HPR, on a simple and easy to-build 2-meter base antenna as originally described in this month's QST. A more robust version – constructed using Romex house wiring and PVC pipe was also demonstrated.
- To wrap up the meeting, Bryan Jackson, W2RBJ, gave a talk about the Titanic, in memory of its fateful voyage and sinking in April 1912. The presentation was based on his forthcoming book "A Disaster of Consequence".
- Hamburgers and cheeseburgers were cooked on the club's new griddle for everyone in attendance.
- The meeting was adjourned at 8:46 PM.

--de Steve VanSickle WB2HPR / Secretary

EGARA to Support Run for Literacy on May 6th

Ten club members have signed up to provide communications support for the annual Run for Literacy scheduled for May 6th.

The event is held each year to raise funds for literacy programs that serve residents of Rensselaer County. EGARA has supported the race for several years.

The club will staff the race course at the Schodack Landing State Park on Route 9-J. The location will permit communications to operate station-to-station in Simplex mode on 146.550 mhz. Members participating in the event should pre-program their HT radios to that frequency and be sure to have a full charge on their batteries.

Anyone interested in joining the EGARA crew should email Bryan Jackson, W2RBJ, at W2RBJ@Outlook.com



Members of the EGARA team scout the Run for Literacy course prior to the 2017 event

The History of Ham Radio: QST at the Beginning

Chris Codella, W2PA, author, John Pelham, W1JA, editor, Phil Johnson, W2SQ, editor

(Editor's note: By special arrangement with the authors, Sidebands is pleased to present this multi-part series on the history of ham radio. Subsequent chapters will be published in future monthly editions of the newsletter)

The membership had long perceived the need for a regular bulletin of some kind, but the League lacked the funds needed to jump-start it. So, as before, the 46-year-old inventor and businessman Maxim teamed up with 19-year-old Trinity College student Tuska to publish the first few issues themselves. They had already funded the initial printing of the list of stations and other materials.

Sometime in early December 1915, the first issue of a new "Amateur Wireless Magazine" went from the printer to the post office and on across the country to more than 600 members of the not quite two-year-old American Radio Relay League. Its simple cover, a combination of hand-drawn graphics and typeset text, framed its name, QST, in a large banner flanked by two torches—symbols of enlightenment and truth—an implied meaning of its name as a broadcast to amateurs. This number, as magazine issues were then called, carried no volume designator. Who knew how many would follow or for how long? For the 10¢ cover price you got 28 pages of amateur radio including a little over seven pages of advertisements.

Due to slow sales of the List of Stations book, and after consulting with members, Maxim and Tuska decided to "risk a few more dollars" to produce three months' worth QST after which, they hoped, it would become self-sustaining based in part on members buying subscriptions and the other offerings. "If they do, we are all right, and we have a fine future promised us. If they do not, then the president and Secretary will have lost their money and wasted a lot of hard work," wrote Maxim.

On the first page following the contents, this announcement appeared:

"Q S T is published by and at the expense of Hiram Percy Maxim and Clarence D. Tuska. Its object is to help maintain the organization of the American Radio Relay League and to keep the Amateur Wireless Operators of the country in constant touch with each other. Every Amateur will help himself and help his fellows by sending in 25 cents for a three months' trial subscription."

Evidently at least a little money was coming in already since there were ads in the premiere issue. The first one to appear, just inside the front cover, was for J. H. Bunnell and Company, Inc., of New York, where young Irving Vermilya had gone to purchase wire years before. The ad was for "two new specialties": a straight key for \$7.50 (about \$170 in 2012) and a detector holder for \$1.50. The ad referred to the straight key as a "transmitter."

The first classified ads section, called "Second Hand Apparatus," appeared in issue number two and offered to print ads for free "up to a reasonable number of words." It listed items such as Audions, transformers, condensers and coils. Also appearing in that first listing was a "Martin' vibroplex key" for \$5.00—a price one-third lower than Bunnell's straight key.



First Issue of QST - December 1915

ARRL: How Can We Help?

By Dan Romanchik, KB6NU

Recently, I received this email from a reader:

“Hi Dan,

“Hope you’re doing well. I have a couple of questions about the ARRL. I’ve been reading your blog and other sources, and it’s clear that the ARRL is in a little trouble. I have to say, though, that as soon as the current administration in D.C. notices that some of their friends can make money off of amateur radio bandwidth, the whole amateur radio service is in very serious jeopardy. The only way I can think of to counter that would be an organization like the ARRL, and I think there’s really only one organization like the ARRL. Is that not true? If it is, how can we help?”

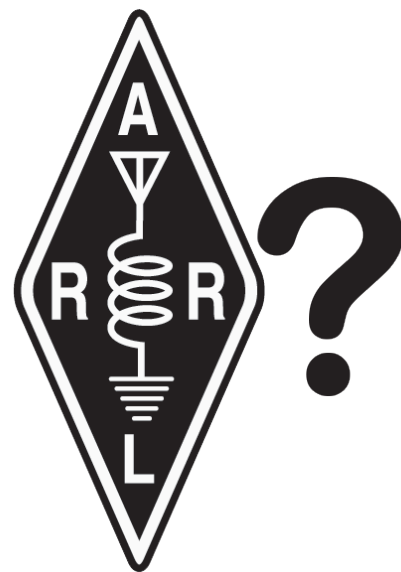
I replied that it is true that there’s only one organization like the ARRL. In the past, there have been groups that have tried to compete with the ARRL, but they’ve never really taken off. It’s an incredible amount of work to set up an organization like the ARRL and none of the alternates have been able to get to critical mass.

The second question—How can we help?—is the big question. Here are a few thoughts:

- Join the ARRL. If you’re not currently a member, join. You’ll have little or no influence, if you are not a member.
- If you are a member, but your friends are not, encourage them to join. The more members the ARRL has, the more influence it will have. This is common sense, but the ARRL doesn’t really seem to care about this. In the past, I’ve encouraged the ARRL to set a membership goal of 25% of licensed radio amateurs (link 1, link 2). I honestly don’t think this is asking too much, and I’ve never heard a good argument for them not to do this. They continue to ignore me, and the percentage of licensed radio amateurs that are ARRL members continues to decline.
- Take an interest in ARRL matters and let your director and vice director know your views. Get your friends to do likewise. Get on the mailing lists for the board meeting agendas and minutes. To do this, log into the ARRL website, click on “Edit your profile,” then “Edit email subscriptions.”
- Invite your ARRL elected officials—your division director, vice director, and section manager—to talk at your club meetings. Be prepared to grill them on issues that you think are important.
- Run for office yourself. I ran for Great Lakes Division vice director twice. Unfortunately, I lost both times, but even running is a way to have an impact. I’d like to see the “loyal opposition” get organized and challenge the status quo, especially in divisions where I think the current director is making bad decisions.
- Having said all that, there are ways to make an impact besides playing ARRL politics:
- Get on the air. It’s easier to lose bands if we’re not using them. Encourage others to be active.
- Be an Elmer to those who need help.
- Teach classes to help those who want a license get a license and those who are already hams to upgrade their licenses.
- Be an ambassador for amateur radio, especially to related groups, such as the “maker” groups that have sprung up around the country. Make sure that they know about your amateur radio club and the classes and exam sessions that you offer.

I’d love to hear any other thoughts that you all may have on this. I really do think that at this point, we need to inundate the ARRL with input from the membership. While they may have a long history of ignoring the membership and just going about their own merry way, now is really a time of change, and this might be the right time to set the ARRL on a better path.

About the Author: When he’s not getting all worked up over ARRL politics, Dan blogs about amateur radio at KB6NU.Com, teaches amateur radio classes, and works CW on the HF bands.



May: The Month in Radio History



May 2, 1934: WLW begins operation with 500 kW transmitter

May 3, 1971: All Things Considered debuts on NPR

May 4, 1920: RCA holds first meeting

May 6, 1937 WLS(AM) reporter Herb Morrison describes fiery disaster of zeppelin Hindenburg ("Oh, the humanity!") at Lakehurst, NJ.

May 9, 1932: WFLA/WSUN, Clearwater, Fla., tests first directional antenna in the U.S.

May 11, 1998: Lucent Digital Radio created

May 12, 1908: Stubblefield granted patent 887,57 for wireless telephone (conduction system)

May 12, 1941: Konrad Zuse displays the Z3 program-controlled (freely programmable) computer

May 15, 2001: XM Satellite Radio completes satellite system

May 16, 1946: Jack Mullin demonstrates Magnetophon at Institute of Radio Engineers convention

May 20, 1901: Fessenden applies for high-frequency dynamo patent

May 22, 1990: Microsoft releases Windows 3.0

May 24, 1844: Morse telegraphs, "What hath God wrought?" from Washington to Baltimore

May 26, 1903: Fessenden granted patent for the liquid barretter microphone

CALENDAR

May 9, 2018 - EGARA Membership Meeting - Hamfest Preparations / Test Your HT Radio - East Greenbush Masonic Temple, 7 pm

May 12, 2018 - EGARA Hamfest 2018 - 8 am to 1 pm at the East Greenbush Fire Department.

June 23-24, 2018 - Field Day, Masonic Temple; Setup on Friday, June 22nd @ 6 pm

Pro Tip: Troubleshooting



Troubleshooting equipment can be tedious and time consuming. But it's always a good idea to start with the obvious. Here is a partial list of things to check before you start ripping the equipment apart:

- Is it plugged in? If so, are the plug and wire OK? Is the outlet providing power?
- If the gear uses an outboard power supply, is it working? A quick test with a volt meter should tell.
- Is the equipment turned on?
- If the "ON" light is not lit, is the light simply burned out?
- Are all the cables connected? To the right places?
- If the gear uses tubes with glass envelopes, are all of the filaments lit? Are they seated properly in their sockets?
- Is a fuse blown?

NOTE: If the fuse is blown, replace it once and try again. If it blows again, then there is a major problem somewhere; Do Not keep replacing the fuse!

The East Greenbush Amateur Radio Association

Organized in 1998, by Bert Bruins, N2FPJ, (SK) and Chris Linck, N2NEH, the East Greenbush Amateur Radio Association, an ARRL affiliate, is committed to providing emergency services, educational programs, and operating resources to amateur radio operators and residents of the Capital Region of New York State. The club station is W2EGB. The club also has several VHF and UHF repeaters open to club members and the public.



For Sale

- **Kenwood TS520S hf rig**, includes DG-5 digital readout Sm-220 scope, 520s-remote VFO, At-250 antenna tuner four ant switch, SP-520 speaker, MC-50 mic, CW key Comes with 2 extra parts machines, 12 conversion unit (not installed), spare 6146 tubes and parts, manuals. Asking \$675.

For Items above contact: Dave, WA2WAP, 518-482-9157

- **SPECO 2 channel scope**. Good for audio work. Power cord and New probe kit included. Very clean and in good working condition. \$60.00
- **Decibel Products, DB-4072, UHF Duplexer**, with mounting brackets, A really low price. \$145.00
- **Kenwood TKR-720 VHF Repeater**, 50 Watts, \$349.00
- **50 W dummy load with SO-239 connection**. \$7.00
- **CSI 12 frequency Selector Switch, CTCSS Generator, BNC Connector** \$25.00
- **UHF RX Preamp** 3 output 1 input for multiple receivers \$25.00
- **VIZ WV-98C Senior Voltohmmyst**, Very Clean condition \$49.00

*For items above contact: John Maddalla, WB2HZT
at radiowizz@aol.com*

- **Eldico R-104 RECEIVER**, 80-10M, \$ 300.00
- **Hammarlund HQ-170 RECEIVER**, 160 through 6 Meter receiver. Does not cover the newer WARC bands of 60, 30, 17, and 12 Meters. \$ 225.00

*For items above contact: Tom Scorsone by email at
KC2FCP@nycap.rr.com*

- **Swan 700 cx** -- Immaculate condition, collector quality. Recently overhauled. includes Shure 444 desk microphone, VX-1 VOX in factory box, very rare Model 510X external 10 pos. crystal oscillator, Model 117XC speaker/PS and original manual. Asking \$700.
- **Swan 250-C / TV-2C** -- Complete 6 and 2 meter station, beautiful condition & in factory box- checked for proper operation. With Model 117XC speaker/PS, (2) Model NS-1 Noise Blankers, with Swan Model TV-2C Transverter & Shure Model 404-C microphone and Swan 210 external VFO. \$750.

*For more info contact Steve VanSickle by email at:
svansick@nycap.rr.com*

Looking to Buy, Sell or Swap?
Send your info to W2RBJ@outlook.com